

Debate: Branches v. Fenestrations for Renal Arteries: Team Fenestrations

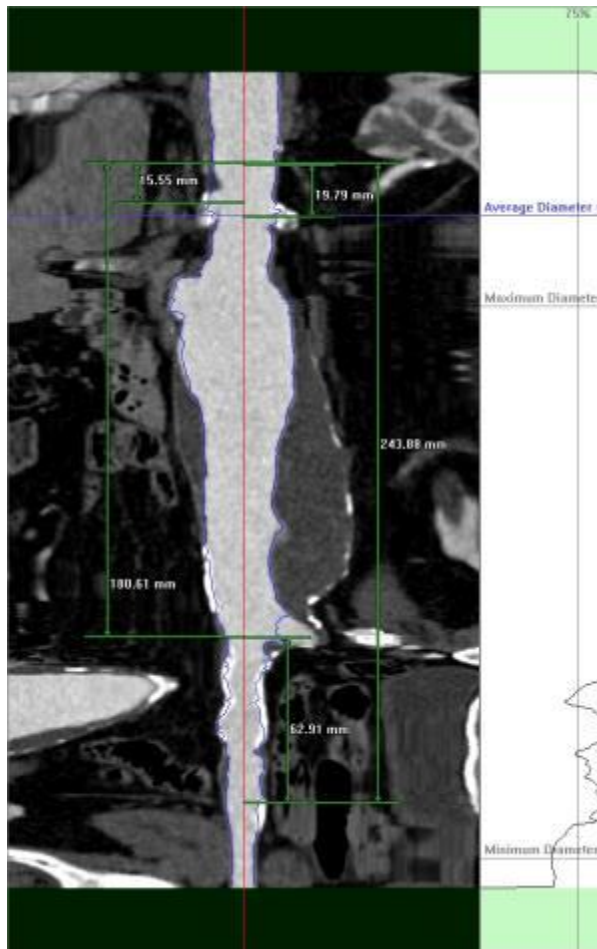
Matthew J. Eagleton, MD

Vice Chairman – Research and Education
Walter Buckley Chair of Vascular Research
Associate Professor

Cleveland Clinic Lerner College of Medicine-CWRU

Critical Issues 2016
Lille, France

Extending the Proximal Landing Zone: Need to incorporate viscerals and renals



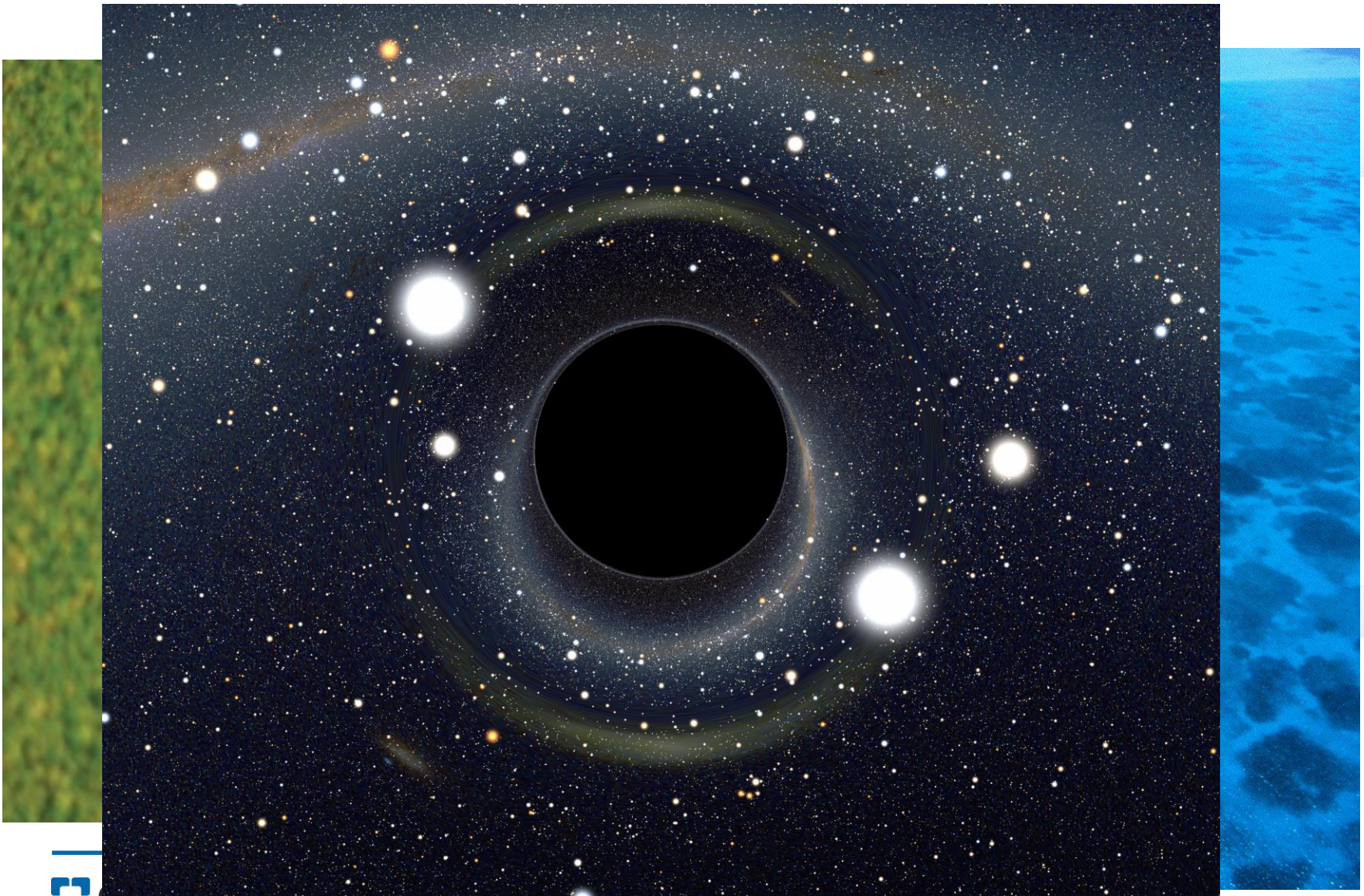
**TO ACCOMPLISH THIS WE
USE:**

**FENESTRATIONS AND
BRANCHES**

FOR SIMPLETONS...

FENESTRATIONS ARE HOLES

And... HOLES are FUN and EXCITING

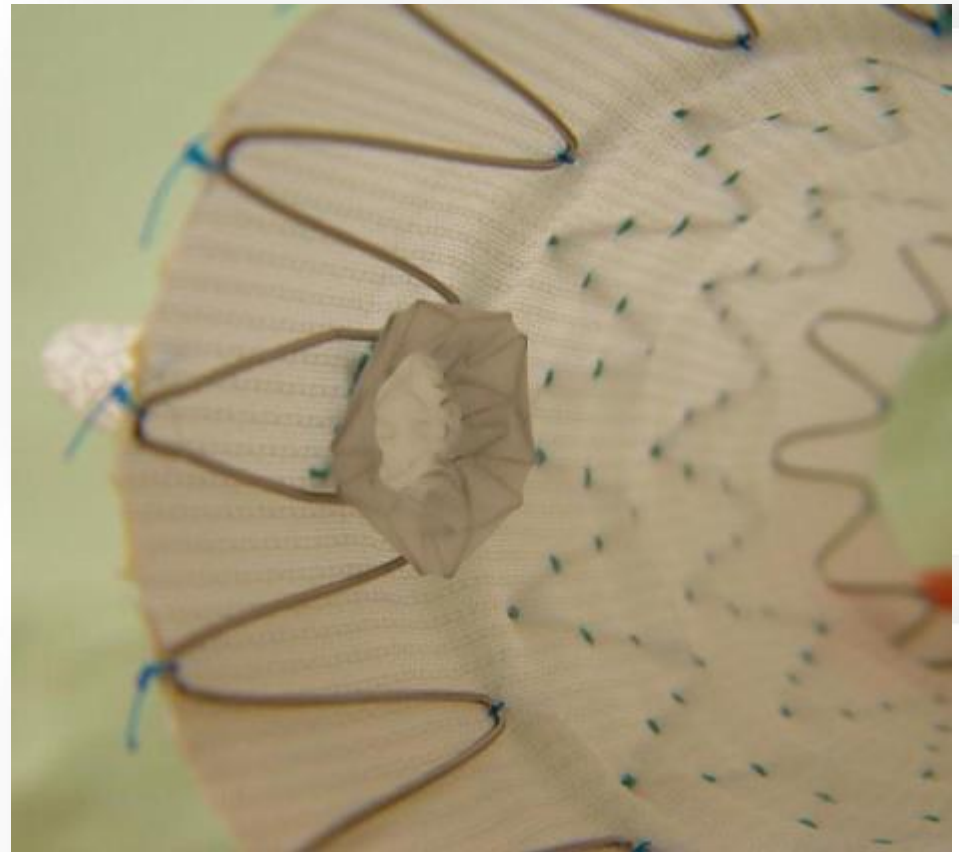


Branches are BORING!!!

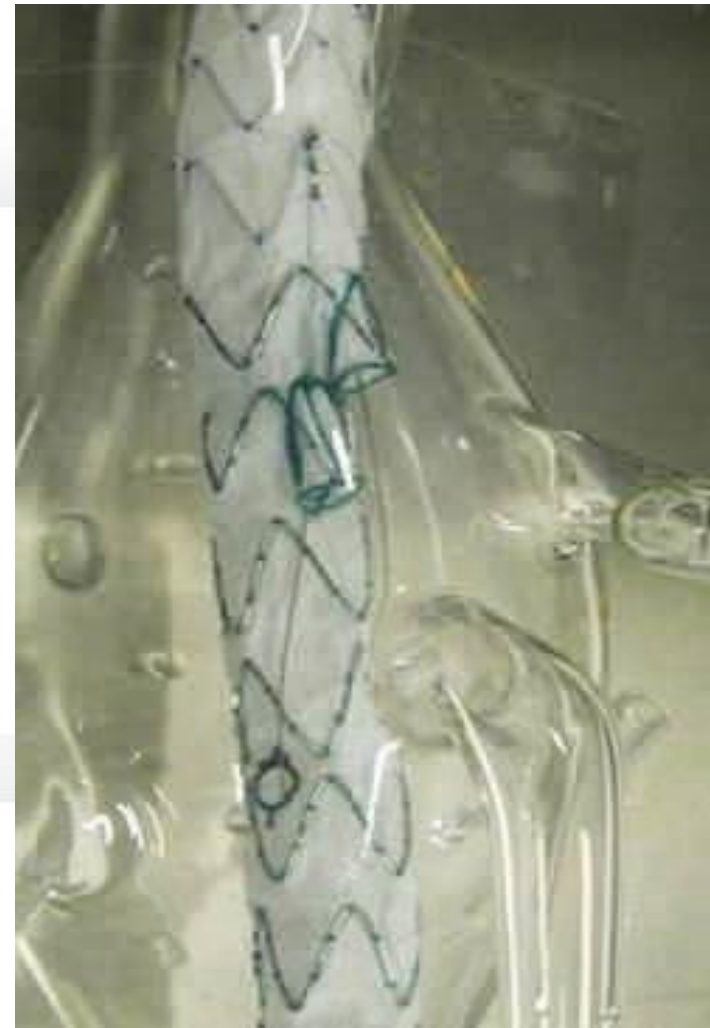


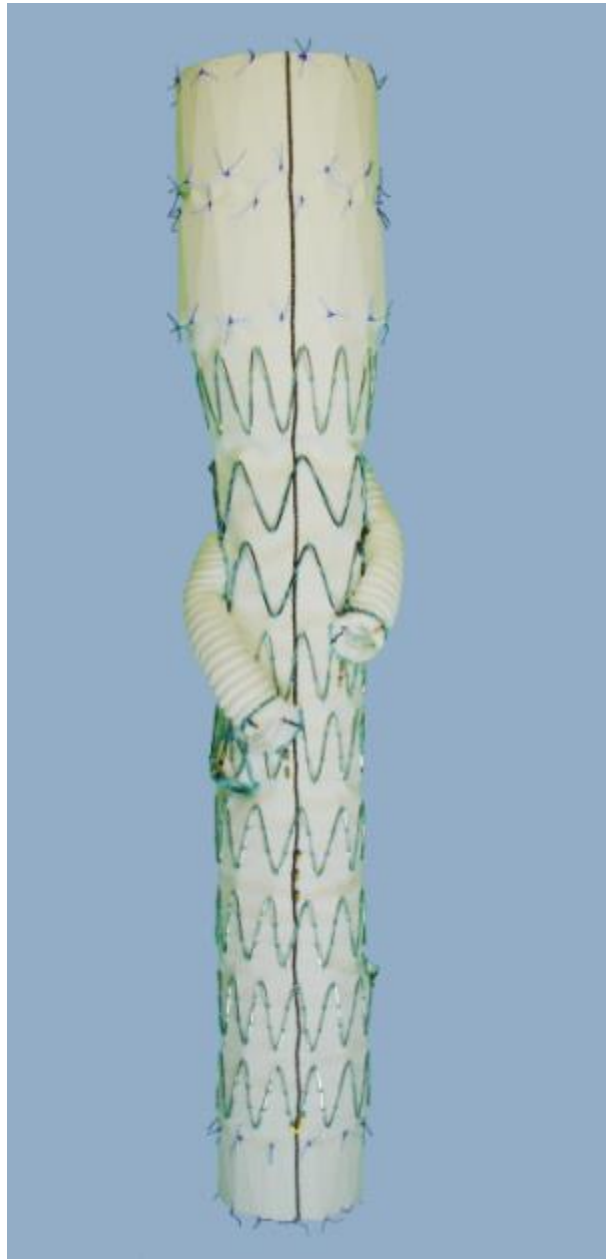
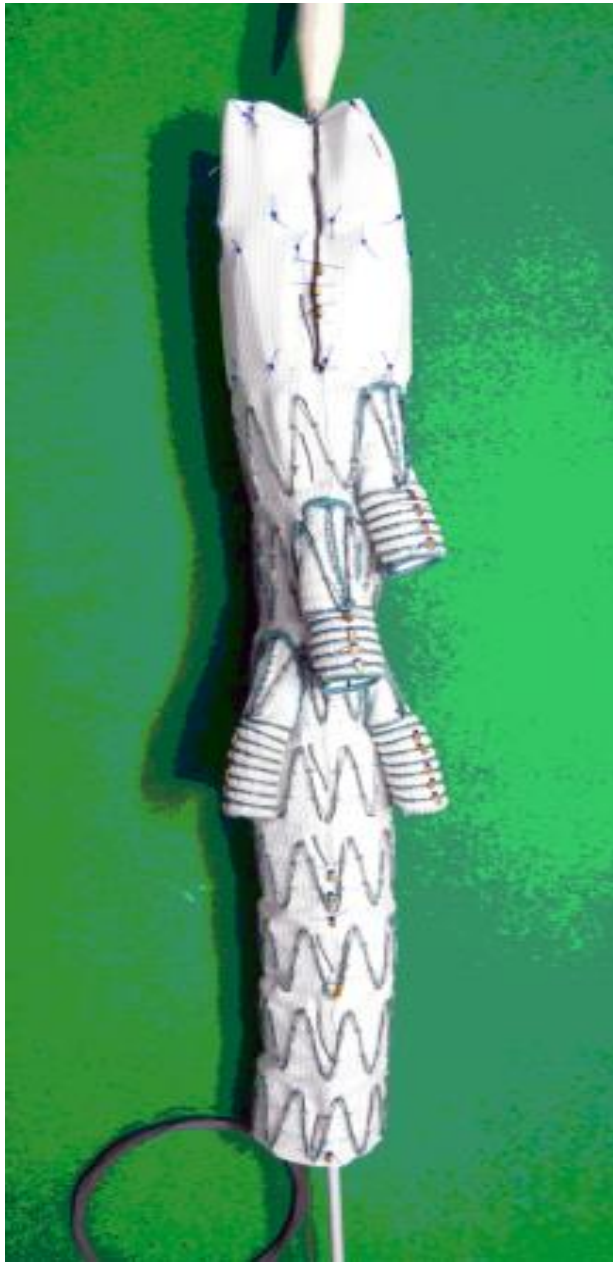
Holes are better!!!

Reinforced Fenestrations



Directional Branches





OUR BIAS OVER TIME...

Device Configuration: 1320 Target Vessels



Renal arteries:



**100% Reinforced
Fenestration-based
branches**



Double Helical Branches with Fenestrations

HOW DO THESE RENAL FENESTRATIONS PERFORM?

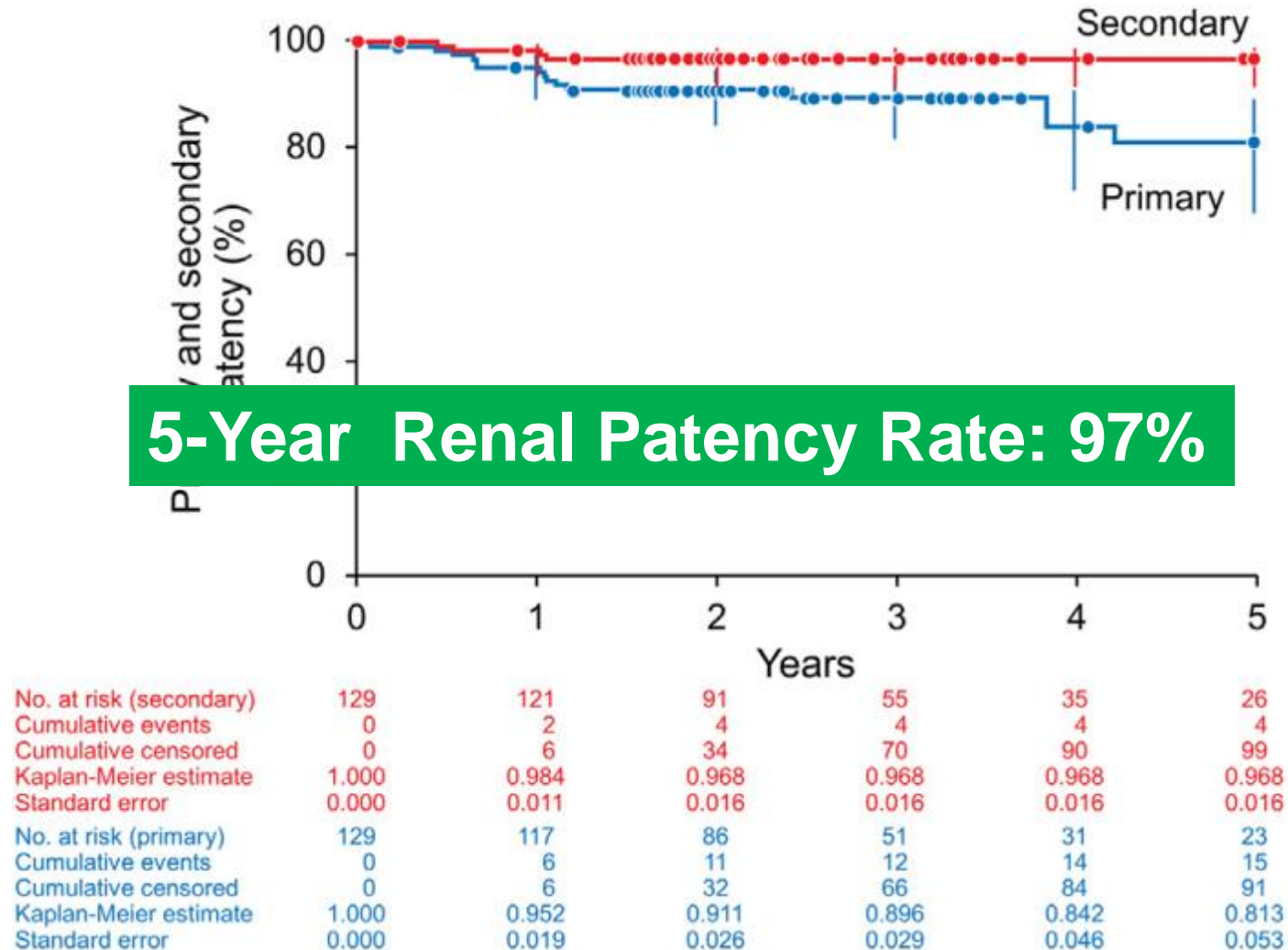
“Simpler” Fenestrated Endografts



US FEVAR Trial: 5-Yr Outcomes

- Prospective, multicenter trial: 14 centers with 67 patients
- **100% technical success**
- **Perioperative mortality: 1.5%**
- **Mean hospital stay 3 (1-6) days**

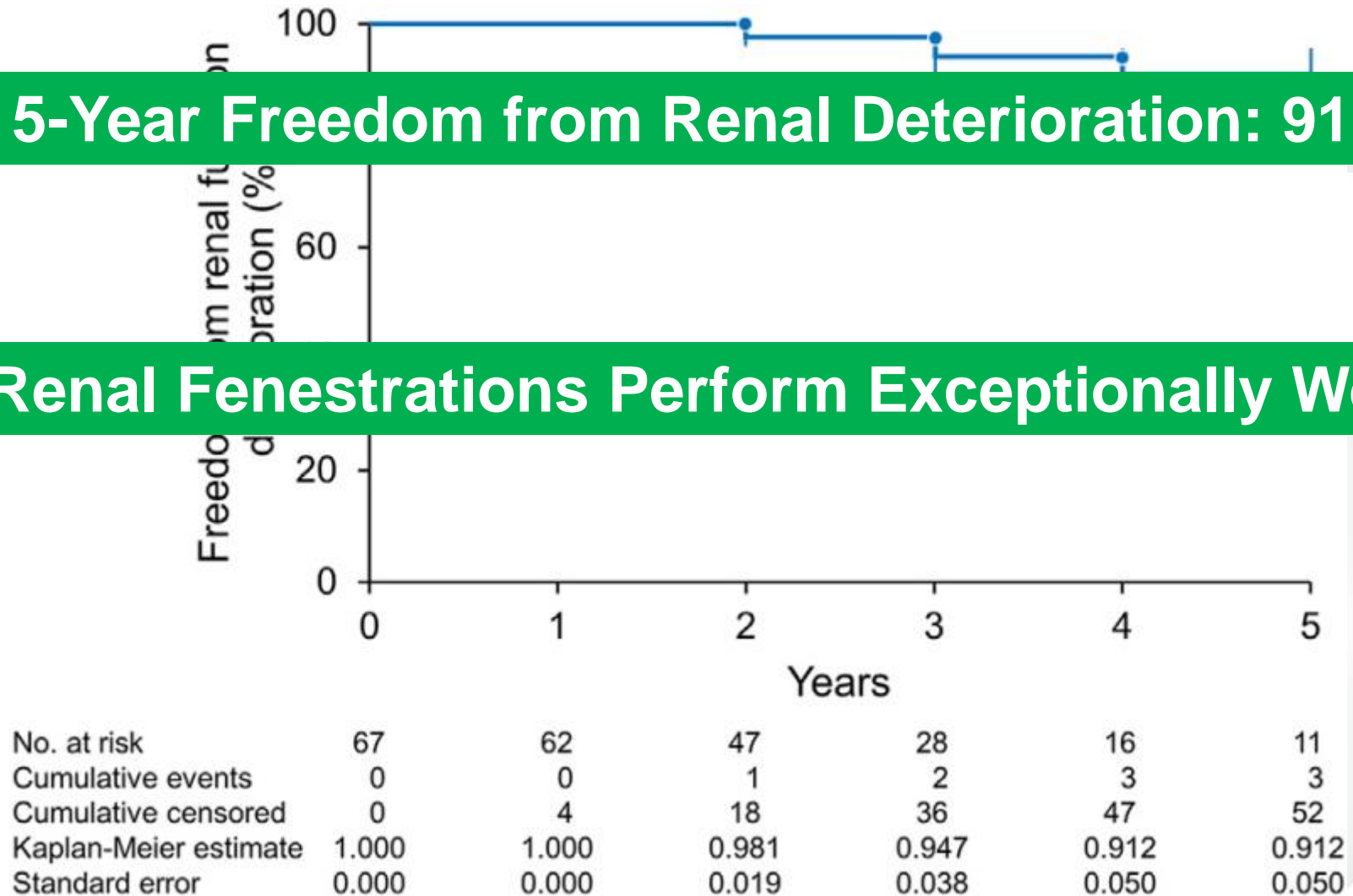
Renal Artery Patency



Freedom from Renal Deterioration

5-Year Freedom from Renal Deterioration: 91%

Renal Fenestrations Perform Exceptionally Well

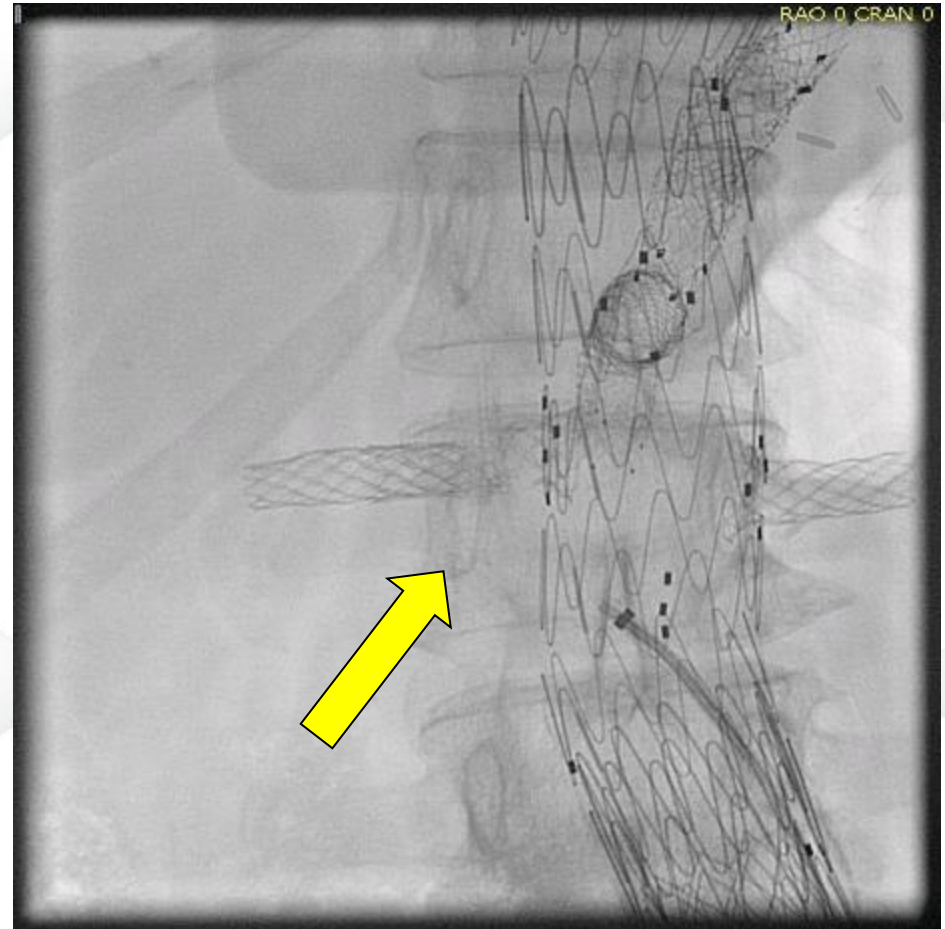


More complex repair durability?



Device Migration

- Device migration:
1.1% patients (N=7)
- 5 required intervention
- 4 were branch related
 - 3 renal arteries stents
 - 1 SMA stent



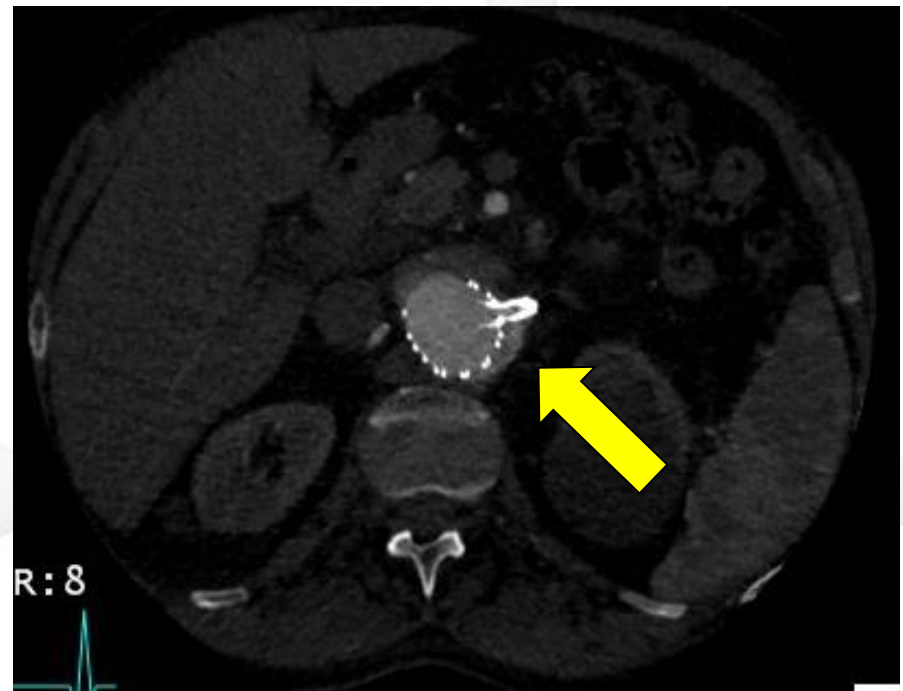
Branch Occlusion

- 30 (1.9%) branch occlusions
 - 1/109 (1%) celiac stents
 - 3/333 (1%) SMA stents
 - 12/558 (2%) left renal artery stents
 - 12/553 (2%) right renal artery stents
- Re-intervention: 11 procedures on 12 branches

Renal Artery Stent Re-intervention

- 30 re-interventions for occlusion/stenosis
 - 33-751 days after the index procedure
- 28 patients had re-intervention for endoleak
 - Time to re-intervention 237 ± 354 days

6% Left renal stents
5% Right renal stents



Freedom from Secondary Intervention

30-Day: 98% (96-99%)

1-Yr: 94% (92-96%)

5-Yr: 89% (78-90%)

**No factor showed association w/
increased risk for re-intervention**

TYPE II AND III TAAA:

**OUTCOMES FOR JUST THE
MORE COMPLEX!**

354 Type II and III TAAA Repairs

942 F/B-EVAR
(2004-2013)

Excluded

5
typ

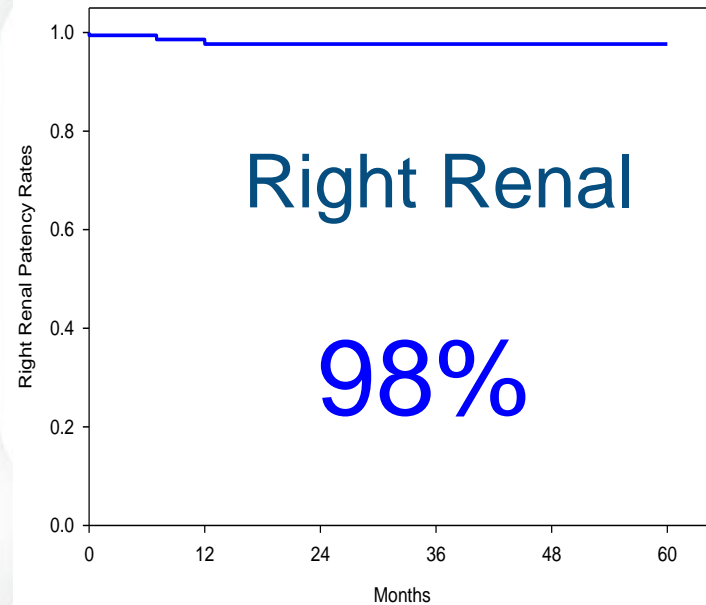
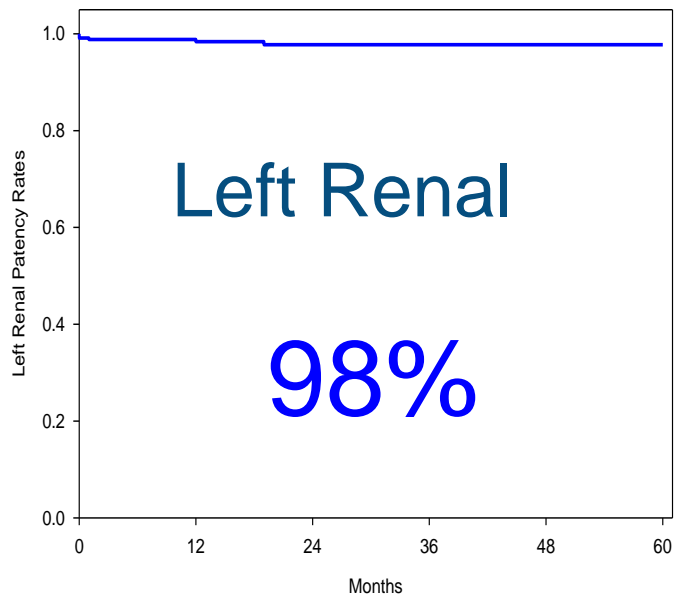
663 Renal Arteries:
331 Right RA
332 Left RA

128 Type II
TAAA

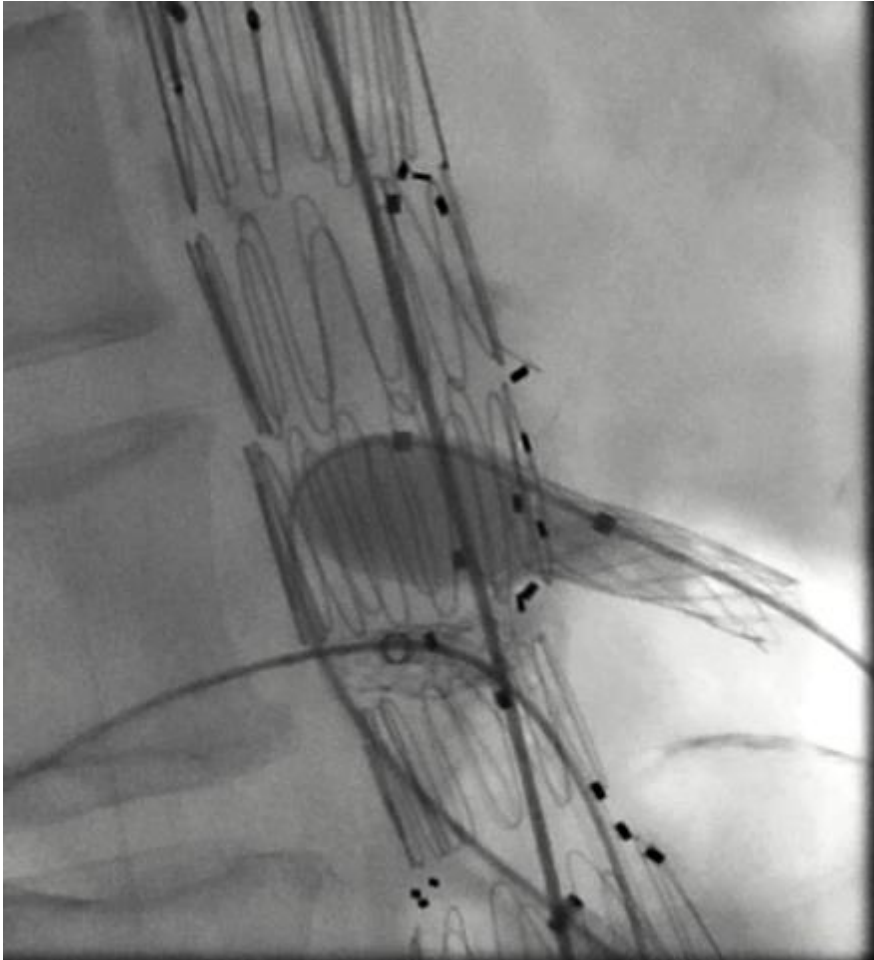
226 Type III
TAAA

36-Month Branch Vessel Patency

Primary Patency
Secondary Patency



Management of Proximal Stent

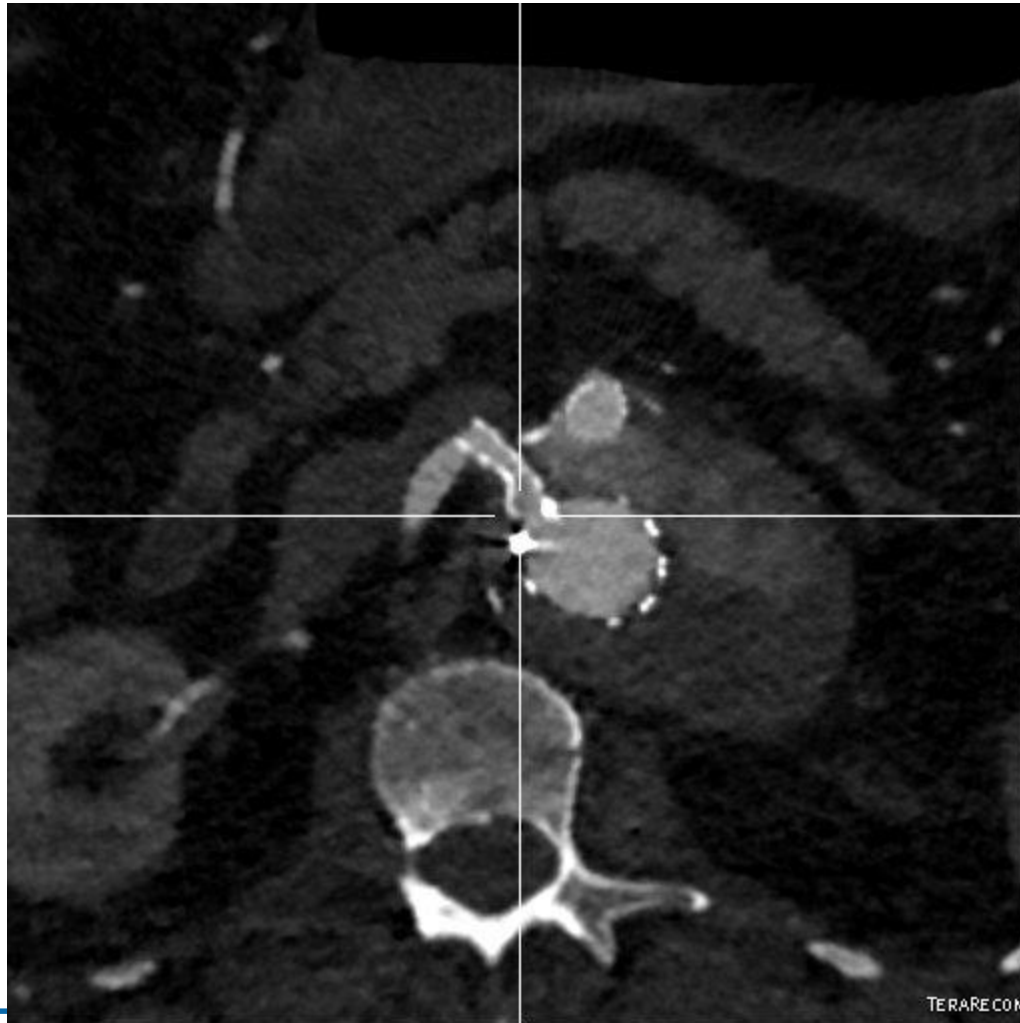


- Stent protrude 2-5 mm into aorta
- Flare: 8-12 mm depending on fenestration
- Alter direction of the stent

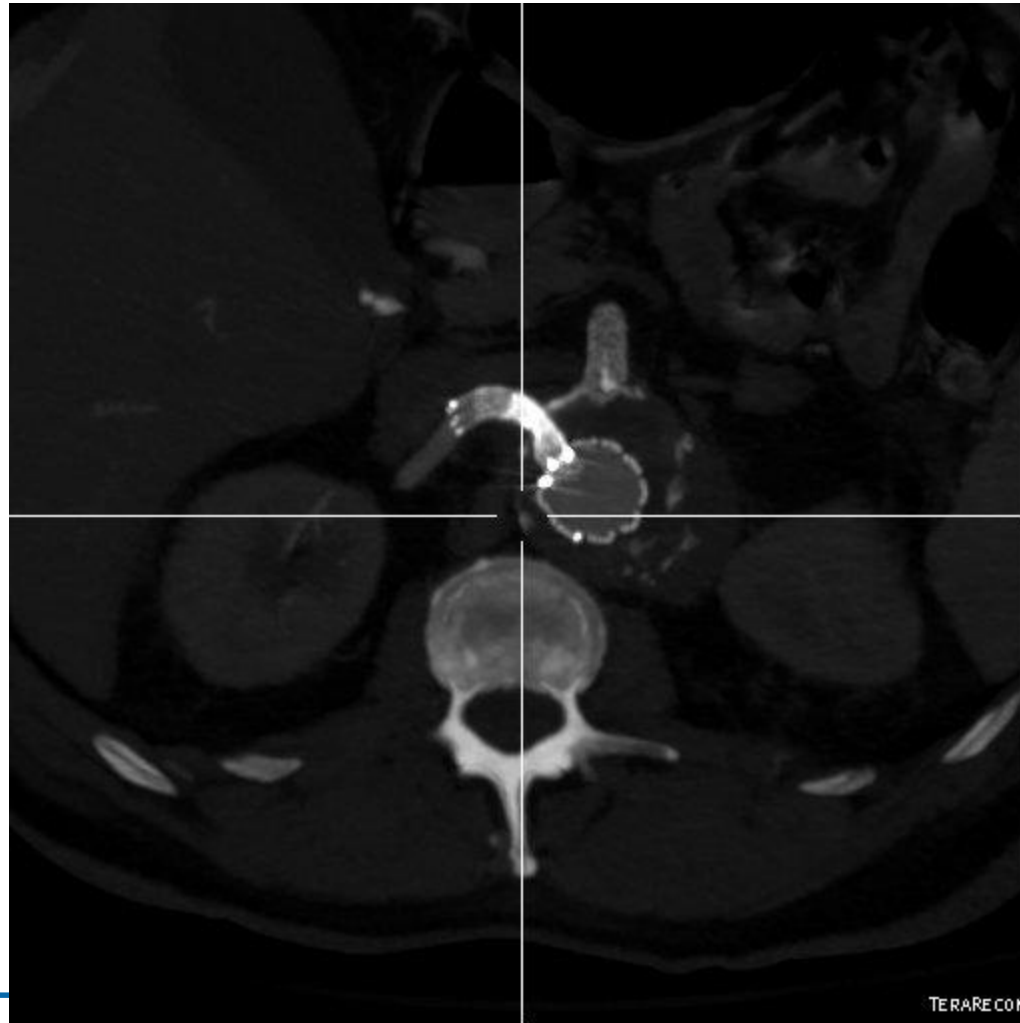
Management of Distal Stent



Clinical Example



Clinical Example



WHAT'S THE PROBLEM WITH DIRECTIONAL BRANCHES?

Renal Artery Patency is Lower with Branches

Visceral Branch Occlusion Following Aneurysm Repair Using Multibranched Thoracoabdominal Stent-Grafts

**Dhanakom Premprabha, MD¹; Julia Sobel, BS²; Chris Pua, PhD²; Karen Chong, BS²;
Linda M. Reilly, MD²; Timothy A.M. Chuter, DM²; and Jade S. Hiramoto, MD, MAS²**

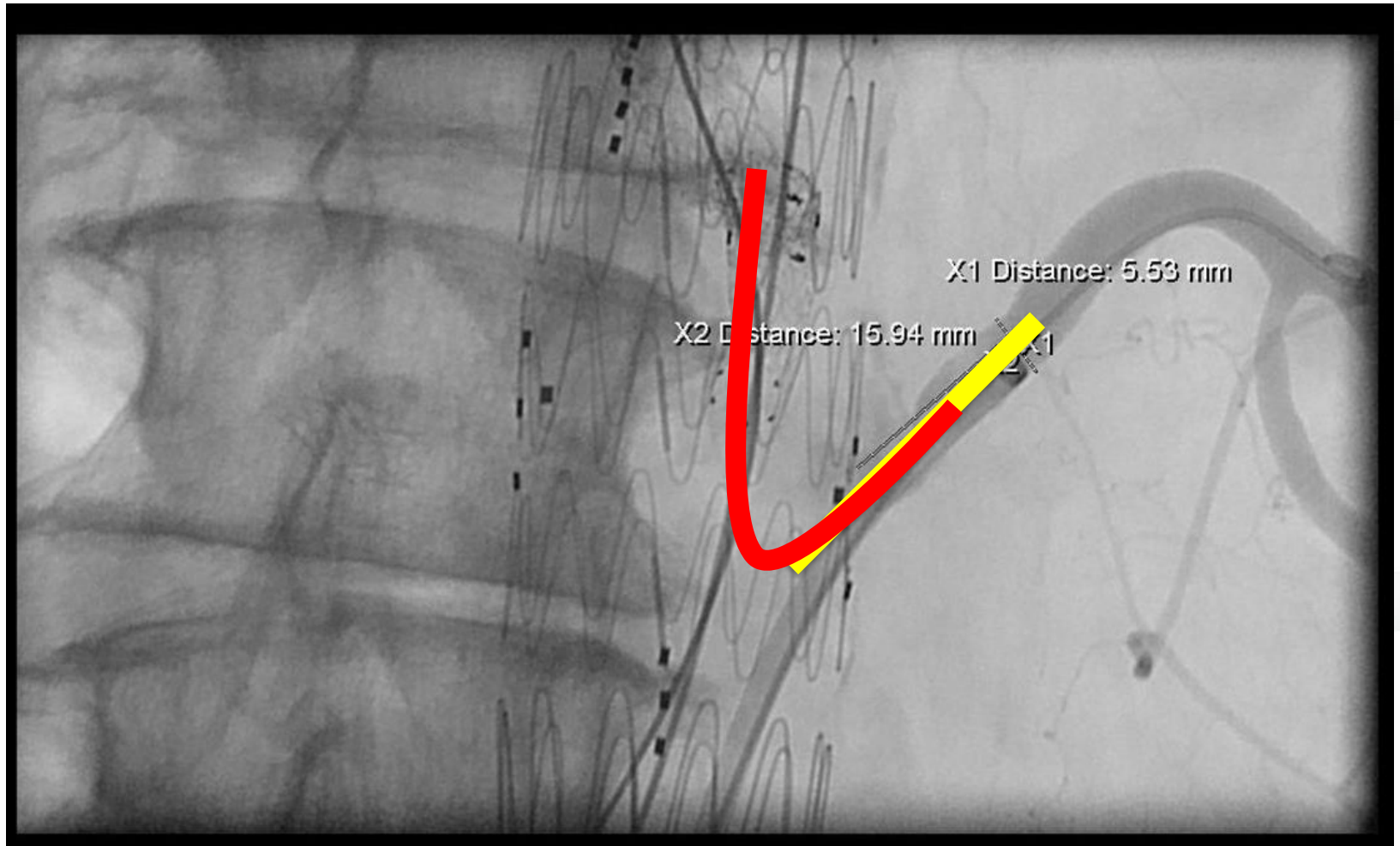
¹Department of Surgery, Prince of Songkla University, Hat Yai, Songkla, Thailand. ²Division of Vascular and Endovascular Surgery, University of California at San Francisco, California, USA.

Renal Artery Patency is Lower with Branches

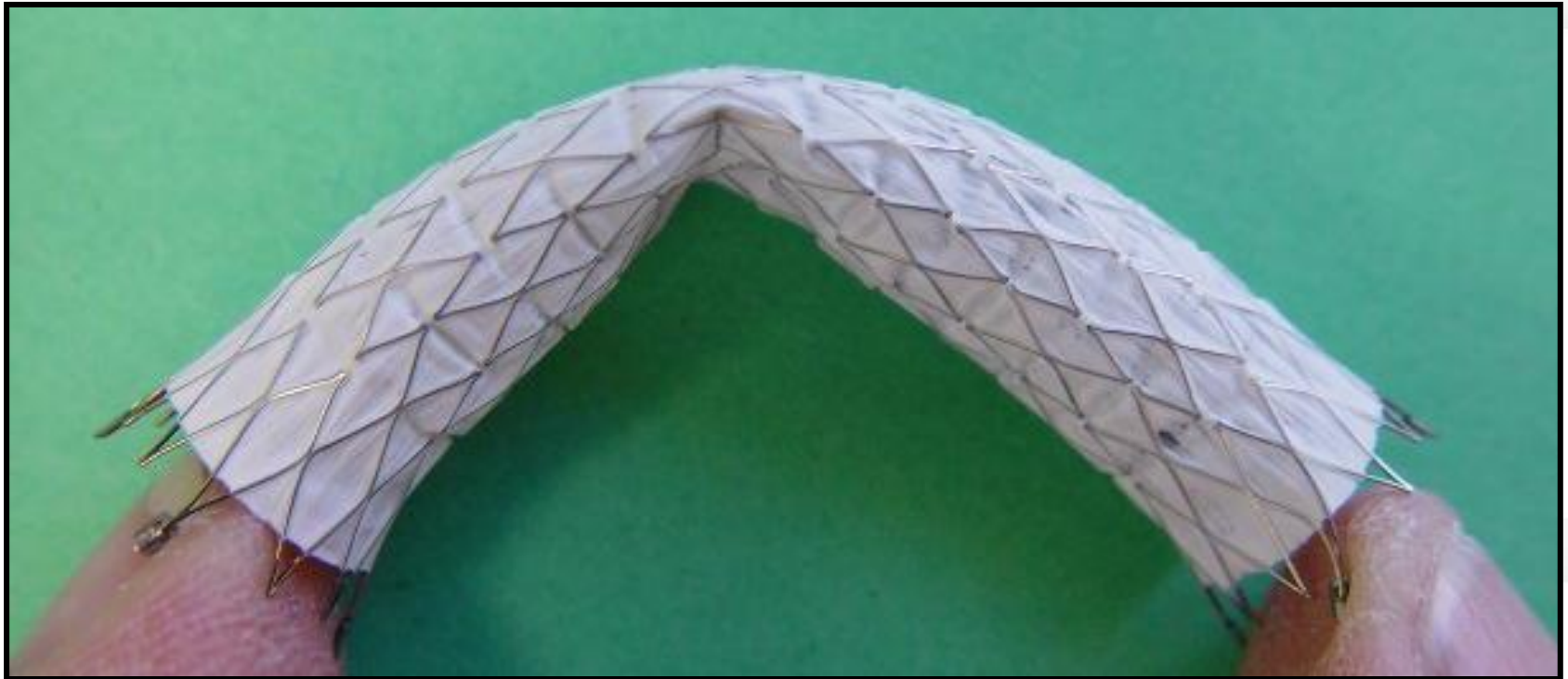
- 100 patients
 - 95 celiac artery branches
 - 100 SMA branches
 - 187 renal artery branches
- Occlusions:
 - Celiac: 2.1%
 - SMA: 0.0%

–Renal artery: 9.6%

Is this a problem with renal artery angles?



Or the bridging stents' lack of sufficient flexibility?



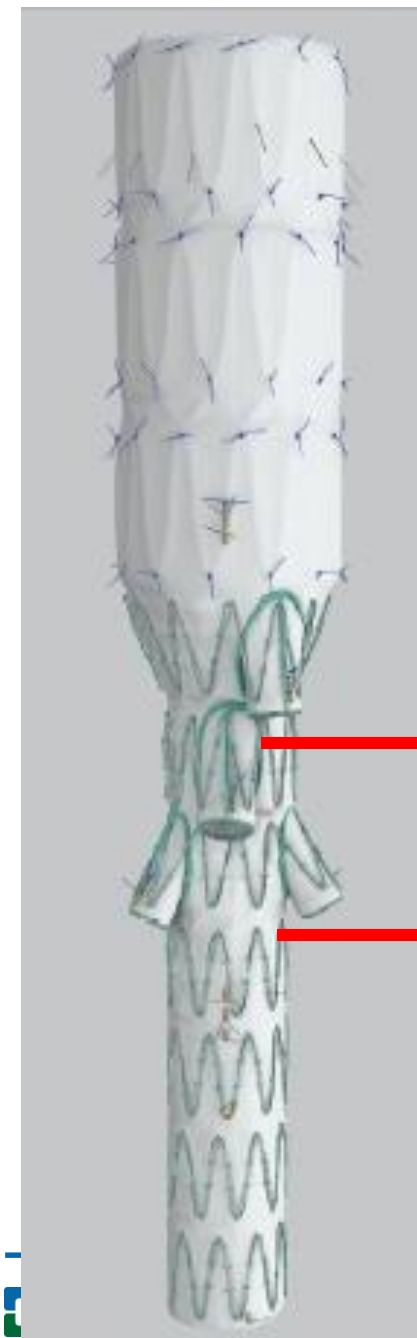
Procedure/Graft Planning Problem

- How much above the celiac needs to be covered to utilize directional branches for the renal arteries?

Twelve-year results of fenestrated endografts for juxtarenal and group IV thoracoabdominal aneurysms

Tara M. Mastracci, MD, Matthew J. Eagleton, MD, Yuki Kuramochi, BScN, Shona Bathurst, and Katherine Wolski, MPH, *Cleveland, Ohio*

- SCI
 - Mean coverage above celiac: 52 ± 21 mm
- No SCI
 - Mean coverage above celiac: 33 ± 21 mm



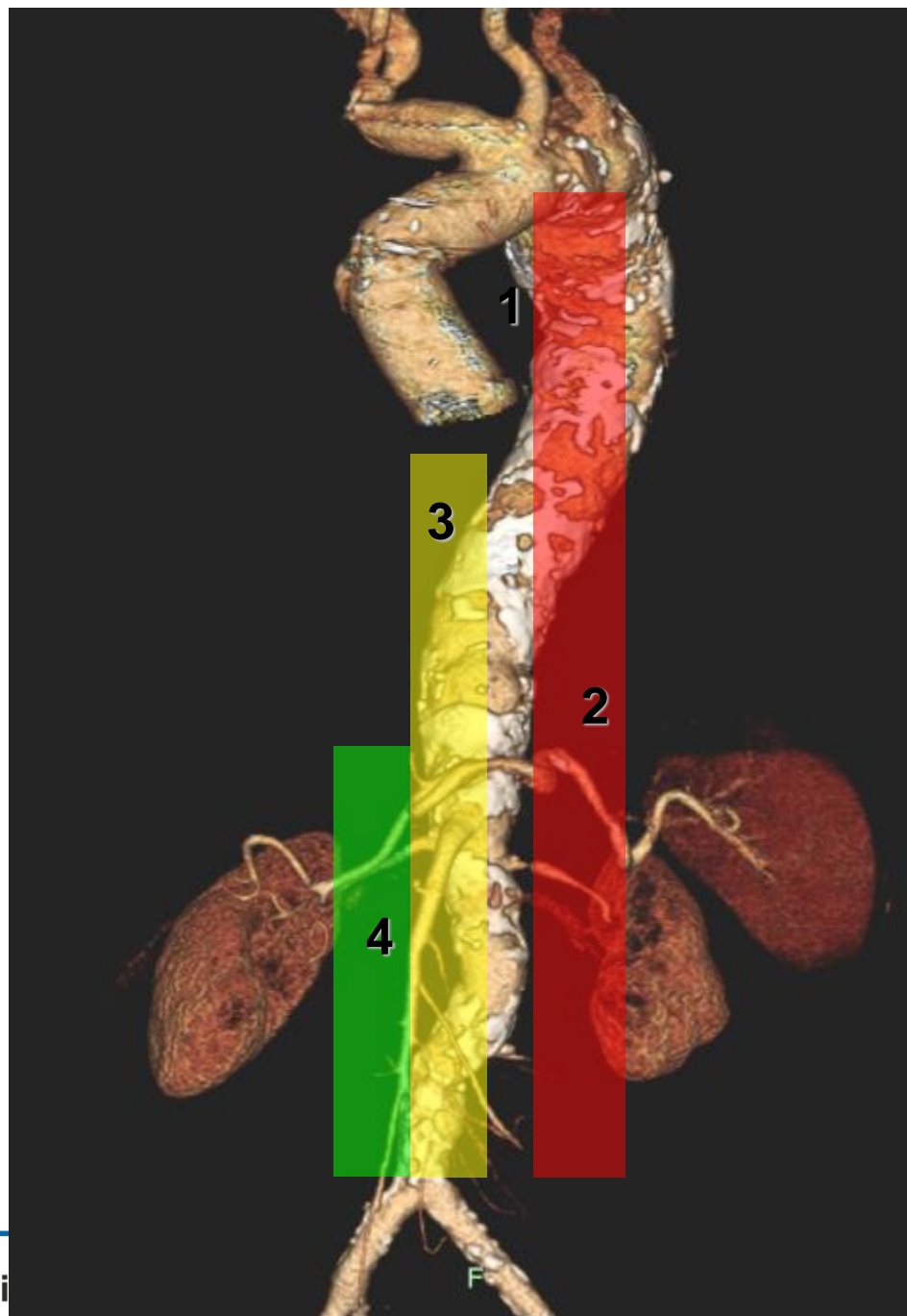
-99 mm

-135 mm

Lower extremity weakness after endovascular aneurysm repair with multibranched thoracoabdominal stent grafts

Julia D. Sobel, BS, Shant M. Vartanian, MD, Warren J. Gasper, MD, Jade S. Hiramoto, MD, Timothy A. M. Chuter, DM, and Linda M. Reilly, MD, *San Francisco, Calif*

- Lower extremity weakness: 21%
 - 13% full recover
 - 8% persistent deficit
- No bias based on Crawford extent of aneurysms
 - Included Type II-IV aneurysms



**FENESTRATIONS ARE
BETTER...**

**ROOT FOR US
HOLES**

